

WHAT IS CLAIMED IS:

1. A monopole roof antenna, for use with at least two wireless communication services, of different frequencies comprising;

a monopole element (10) structured essentially along a straight line (11),

a roof capacitor (1) that is structured essentially as a flat area, and disposed substantially perpendicular to the straight line (11), and connected with said monopole element (10), said roof capacitor (1) being essentially structured with rotation of symmetry, and comprising a plurality of flat ring structures (2) that are separated from one another by ring-shaped gaps (3) of said monopole element (10), said ring structures being disposed concentric to the straight line (11),

reactance circuits (4) disposed in said ring-shaped gaps (3) and coupled to adjacent ring structures (2,2') in a frequency-dependent manner, so that all of said flat ring structures are active for a wireless communication service having the lowest frequency, and wherein said outermost ring structure (2) is essentially ineffective for the wireless communication service having the next higher frequency,

because of the high impedance of said reactance circuits (4), and wherein for more than two wireless communication services, the dimension of the outermost of the active ring structures (2) connected with one another by means of said low impedance reactance circuit (4) is smaller at a higher frequency of the wireless communication services.

2. The monopole antenna according to Claim 1, wherein the inside radius of said innermost ring structure (2), is selected towards zero, so that the latter is configured as a closed area (5), and that the latter is connected with said monopole element (10).

3. The monopole antenna according to Claim 1, wherein the inside radius of said innermost ring structure (2) is configured with a gap width (6) and wherein at least one of said reactance circuits defines the connection between said innermost ring structure (2) and said monopole element (10)

4. The monopole antenna according to Claim 1, wherein said reactance circuits (4) are composed of a plurality of dummy elements (8) that are selected so that all of the ring structures that contribute to the formation of the active

roof capacitor in the frequency range of one of the wireless communication services are connected at low impedance with said monopole element (10), by way of the chain of said reactance circuits (4) in this frequency range.

5. The monopole antenna according to Claim 1, wherein in order to improve the rotational symmetry of the arrangement, several of said reactance circuits (4) are uniformly connected in parallel to the circumference of the ring structures (2), the parallel electrical effect forming a sufficiently great reactance $X(f)$ for the higher frequency ranges, which is at sufficiently low impedance to turn on the next outer ring at the lower frequencies.

6. The monopole antenna according to claim 4, for the wireless communication services AMPS/GSM900 in a first frequency range, and the wireless communication services GSM1800/PCS/UMTS in a second frequency range, wherein said roof capacitor (1) contains a closed area (5) and a ring structure (2) that surrounds the former, and that said reactance circuits (4) comprise a plurality of dummy elements (8), so that the reactance $X(f)$ contains a pole in the higher second frequency range, and is at sufficiently high

impedance, and possesses a zero point in the lower first frequency range, and is at sufficiently low impedance.

7. The monopole antenna according to claim 3, wherein said gap width (6) is selected, on the one hand, to be sufficiently large so that the capacitative coupling between said ring structures (2) is sufficiently small, and on the other hand, is selected not to be too large, so that the spatial capacitance of the remaining area of said ring structures (2) is not too small.

8. The monopole antenna according to Claim 2, wherein said closed area (5) is square, and the outer and inner edge of said ring structure (2) are structured to be square, and said ring-shaped gap (3) is sufficiently large and is disposed at a uniform gap width (6) along the circumference of said square ring structure (2).

9. The monopole antenna according to Claim 8, wherein said roof capacitor (1) has different dimensions in the lengthwise and crosswise direction, due to its design requirement, and that the ratio of the lengthwise to crosswise dimension is not greater than 3.

10. The monopole antenna according to Claim 2, wherein said closed area (5) and all the edges of said ring structures (2) are configured to be circular and concentric, and said ring-shaped gap (3) is structured with a uniform gap width (6) along the circumference of said circular ring structures (2).